2000 LEAD REPORT

IDEM

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

2000 Lead-Safe Families for 2000

Lead-Safe Homes for Hoosiers - Project Review

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Table of Contents

Tables

Figures

Section 1: Executive Summary

The 2000 Lead-Safe Families Program was a pioneering effort spearheaded by the Indiana Department of Environmental Management's, Office of Pollution Prevention and Technical Assistance, and the Indiana State Department of Health's, Childhood Lead Poisoning Prevention Program, to protect Indiana preschoolers from the lifelong nervous system effects of chronic lead poisoning.

During the last two decades, research has shown that exposure to lead dust by pregnant women and by children from birth to six years of age has a lifelong detrimental effect on the intellectual and emotional capacities of the exposed children. The major source of childhood exposure is lead dust in the home which is a result of disturbed, damaged, and deteriorated lead-based paint.

Current efforts by the U.S. Centers for Disease Control and Prevention have centered on using community blood testing programs to identify lead-poisoned children. Children with venous blood lead levels above 10 ug/dL face a greater risk, so these programs focus on finding such children and getting them and their parents the necessary educational, nutritional, environmental, and medical interventions needed to limit the effect of elevated blood lead levels.

Testing by the state and local health departments reveals that Indiana has an above average number of cases with blood lead levels 10ug/dL or greater. While the health departments have been working to find and assist such children, current programs are focused on secondary prevention rather than primary prevention. The 2000 Safer Families Program was the first in the nation directed at identifying hazardous homes, hopefully, before the hazard results in actual lead poisoning.

The program successfully recruited, trained, and used the services of seventy state, local, and nongovernmental employees who performed and reported on risk assessments of almost 1300 Indiana residences and child care facilities. Their assessments reveal the major lead-based paint hazards in pre-1978 Hoosier housing arise from deteriorated paint, particularly exterior paint, and showed that the lead dust concentrates around the window sills and troughs.

Most pre-1978 Hoosier homes have not been reached. Further efforts to protect children should be made. Given the altered regulatory environment, a wider range of agencies and organizations should be available to help identify homes and risk assessors. Although the program did not reach as many families as originally intended, it has provided lasting positive benefits: trained individuals, informed citizens and local health departments. Ways to strengthen follow-up programs are presented.

Section 2: Introduction

I. The Vision

Chronic lead poisoning is probably the most preventable cause of childhood brain damage in the United States.

In the late summer of 1998, the Indiana Department of Environmental Management (IDEM) and the Indiana State Department of Health (ISDH) initiated a new and bold approach for protecting Indiana children from this permanently disabling disease. ISDH and IDEM proposed to reach out to 2000 families across the state to provide free lead hazard risk assessments of their dwellings.

Besides preventing childhood lead poisoning, the program was designed to raise Hoosiers= awareness of the problem and to provide the certified training needed by health department inspectors to meet the new state and federal licensing requirements.

This program was conducted in cooperation with the Marion County Health Department (MCHD) and other Indiana local health departments. The Environmental Management Institute, Inc. (Institute) with its subcontractors, ACM & Environmental, Inc., and CHC Technologies, Inc., served as contractor to IDEM in completing the project.

II. The Problem

Lead poisoning has been identified by public health experts and by Congress as a major threat to the sound mental development of our nation's children. Children exposed to even very low levels of lead during the developmentally important years, from the womb to about six years of age, can sustain permanent mental disabilities, even at levels that are non-toxic to adults.

Indiana has one of the highest rates of lead poisoning in the nation. In various parts of the state, children are regularly exposed to one or more of the three greatest sources of childhood lead poisoning:

- lead-based paint and dust
- industrial lead residues
- lead in drinking water

Lead-based paint (LBP) was commonly used in and on houses throughout most of the 20th century. Besides its use as a pigment, it imparted a number of useful properties to oil-based finishes including corrosion-resistance, film durability, self-cleaning (chalking), and controlling drying time. The use of LBP in residences was banned by several cities in mid-century and was banned in 1978 by the Consumer Products Safety Commission. Paint now used in or on homes cannot contain more than 0.06% lead. Most paint contains much less, if there is any present at all.

The current allowable level contrasts greatly with the level in homes during the first half of the 20th century. For classification purposes, the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Housing and Urban Development (HUD) define LBP as having a lead concentration that exceeds 0.5% (5000 ppmw) or a surface lead loading that exceeds 1 mg/cm2. The actual levels found in many Indiana homes easily exceed these amounts (Section 4, Results). Lead continues to be used as an additive in non-residential paints. Steel structures such as bridges and water towers are still coated with anticorrosion paints containing lead. Since over half of Indiana housing was constructed prior to 1978, there is a vast reservoir of potential LBP hazards in Indiana homes and neighborhoods.

Industrial lead residues have also been a problem in some areas of the state. Presently, there are only two remaining secondary lead smelters in the state, but there has been significantly more activity in the past. Current lead-producing and lead-using facilities are subject to stringent air, water, waste, and reporting regulations, but this was not always the case. The recently completed Harris Street cleanup in Indianapolis was designed to render the residues of a former lead oxide manufacturing site safe for people still living in the area. The impact of such plants, though potentially very serious for neighbors, is very localized and does not pose a significant risk for most Hoosier children.

Indiana is fortunate in that lead in drinking water is also highly localized and without widespread impact. Indiana public water supply companies are required to monitor for lead, and, in most cases, lead levels are undetectable or well below the national drinking water limits. The low lead levels are primarily due to the high calcium hardness levels in Indiana. Lead is almost insoluble under these circumstances, and, even where lead is present on pipes or solder joints, it is quickly coated over and becomes insoluble. Indeed, in parts of the country where lead exceeds EPA standards, water supply companies are required to do what nature does for most of Indiana: add calcium compounds to precipitate the lead.

However, health departments sometimes find that even, though none of the big three lead sources is present, children still have elevated blood lead levels. Other known sources of childhood lead poisoning include (alphabetically):

- ceramic ware, especially materials fired at low temperature
- hobbies (such as stained glasswork , bullet casting, or soldering electronic components)
- medical preparations from alternative healthcare suppliers
- metal-supported candle wicks (various brands)
- paints on toys, furniture, etc. (not allowed, but sometimes found)
- printer's inks (various inks)
- residues on clothes of parents who work with lead or use it for hobbies
- soil residues from leaded gasoline (widespread along public thoroughfares, but usually covered by grass or other plant growth)
- vinyl miniblinds (now withdrawn from use)
- solder from food cans (illegal, but found on some imported foods)

Thus, Indiana children are potentially exposed to many sources of lead. The most widespread and common of these is residential LBP hazards. Contrary to popular belief, chewing lead-painted surfaces and eating LBP chips is a minor contributor to the problem. The major source is lead dust from deteriorated paint, renovation activities, or soil residues of LBP.

Lead dust is in a form where it is readily ingested or inhaled by small children. When it enters the body, it passes relatively easily into the blood stream where the damage begins. Lead affects a number of organs, but the major targets are the nervous system, the kidneys, and the blood-forming system. In preschool children, lead interferes with the rapidly developing brain and causes permanent brain damage. Because of its chemical similarity to calcium, lead is partially removed from the blood and stored in bone, forming a reservoir which may cause additional lead poisoning later in life.

To determine whether a child has lead poisoning, families should have the concentration of lead in a child's blood determined by the family physician, a clinic, or the county health department. Blood lead level is the best predictor of the risk of damage. The Centers for Disease Control and Prevention (CDC) has set 10-ug/dL (ten micrograms per deciliter) as the Community Action Level for blood poisoning. A child is considered to have an elevated blood lead level (EBLL) and should be monitored on a regular basis. If the blood lead level rises, more aggressive actions are required (See Figure 1). HUD considers a child with a reading above 20- ug/dL (or two consecutive readings above 14-ug/dL) to have an environmental intervention blood lead level (EIBLL) and requires special procedures in a federally-owned or federally-assisted home where such a child resides.

ISDH confirms that there are many EBLL children in the state, and that these children tend to be concentrated in the low income parts of the major urban areas (See Figure 2 and Table 1). Families in newer and better maintained housing are generally at lower risk, but renovating or rehabilitating older housing has resulted in poisoned children, even in affluent neighborhoods.

To protect a child against LBP-induced lead poisoning, it is not necessary to remove or permanently cover all LBP-coated surfaces. Instead, it is only necessary to prevent dust generation from these surfaces. Furthermore, where dust generation occurs at low levels (such as from friction on window or door surfaces), some hazard reduction can be achieved by regular wet cleaning or by vacuuming with a high efficiency particulate air (HEPA) filtered vacuum cleaner.

Before remedial action is taken, it is important to identify potentially hazardous homes. In the past, this has generally been discovered by health department inspectors following up on an EBLL child. This practice turns children into the equivalent of a canary in the mine, by allowing children to be exposed already potentially damaged before any action is taken.

Thus, the vision of the 2000 Lead-Safe Families for 2000 Program was to make it possible to identify homes with potential problems rather than to wait for children with actual problems. The method suggested was lead-based paint inspection. In this method, a trained inspector identifies LBP in a residence by using an x-ray fluorescence analyzer (XRF). While this will not identify all sources of lead poisoning (such as lead in soil or drinking water), it does provide assistance in locating potential residential sources of lead poisoning. Therefore, IDEM, with the assistance of ISDH and MCHD, set out to make this new tool more widely available to Hoosier families.

III. The Plan

Because this strategy for reducing LBP-induced lead poisoning had never been tried on such a scale, IDEM sent out a broad agency announcement early in 1998, asking contractors to provide proposals for training individuals and inspecting Indiana homes. The Institute and its associates recommended that instead of inspections, risk assessments should be undertaken. Risk assessments focus on lead hazards, rather than simply LBP.

Instead of using the XRF to identify whether painted surfaces exceed the HUD/EPA definition for LBP, the risk assessor uses a combination of interviews, visual assessment, and chemical sampling and analysis to determine whether there are any LBP hazards, soil-lead hazards, dust-lead hazards, or drinking water-lead hazards at the property. This method has the advantage of locating a wide range of hazards at a cost which is generally well below the cost of an inspection using only an XRF. In addition, a risk assessment would detect hazards (such as in soil and water) which would not be found by an inspector using only an XRF.

The group, headed by the Institute, also emphasized ensuring standardized procedures for conducting the assessments and standardized forms for recording and reporting the results. Since such forms did not exist, they would have to be developed. Furthermore, to ensure that assessors were using these tools properly, it was decided that, after completing training, novice assessors would be accompanied on their first assessments by an experienced mentor. Finally, before the reports were returned to the owner or occupant and the health department, a trained assessor would review it for coherence and correctness.

This general plan was ultimately adopted, and its implementation involved close cooperation among several agencies and organizations.

1. Obtaining, Training, and Licensing Assessors.

a. IDEM, ISDH, and the Institute would cooperate in identifying individuals to be trained as assessors. As the program developed, the Indiana Department of Transportation (INDOT), several local health departments, and the Indiana Chapter of the Academy of Hazardous Materials Managers also cooperated in this effort. IDEM's efforts were assisted, in part, by Americorps members who worked at the agency during this period.

b. The Institute would provide EPA- and Indiana-approved training courses at no cost to the persons who would conduct the assessments. These courses were held not only at the Institute's training facility but also at several locations around the state. Persons receiving training would agree to perform at least 20 risk assessments, including the mentored assessments, in return for the free training.

c. The IDEM Office of Air Quality (which administers lead licensing) would work with the trainees to ensure that they received testing and, when they had passed, licensing which would allow them to perform the assessments.

2. Obtaining Homes for Assessments

a. IDEM and ISDH would advertise the availability of risk assessments to Indiana owners and occupants. ISDH would gather the requests for such assessments through its state-wide hotline, and IDEM would match persons seeking assessments with assessors in their geographic region.

b. MCHD would assist with assessing homes identified by the IDEM/ISDH efforts.

3. Assessing the Homes

a. Assessors would arrange with the occupant to visit the homes and collect the necessary information and samples to complete the assessment. The assessor would submit the samples collected to the ISDH for analysis.

b. The ISDH laboratory would analyze the samples submitted, using accepted laboratory methods, at no cost to the assessors or occupants.

4. Preparing and Submitting the Assessment Report

a. After completing the initial visit, the assessor would prepare and submit a preliminary report to the Institute for review by the Institute's partners.

b. The reviewer would indicate whether the initial report was satisfactory or would point out specific areas where corrections were required.

c. After receiving the analytical results, the assessor would prepare a final report for submission to the Institute.

d. After approval of the final report by its partners, the Institute informed the assessor of the approval and forwarded copies to the owner/occupant and ISDH. Copies of the reports were retained by the Institute and used for preparing statistical reports (incorporated here). The analysis of the data was used without using personal information to protect the confidentiality of the family.

e. Because of its experience and internal review processes, MCHD conducted a number of assessments parallel to this process, but not following all of the same procedures. While the Institute trained their people, MCHD assessors analyzed their own samples, used their own report forms, and conducted their own final review and distribution of the information. Portions of the information from their assessments are reported here, but are separate from the IDEM/ISDH data.

Section 3: Procedures Developed and Used in the State-wide Program

I. Obtaining, Training, and Licensing Risk Assessors

A. Trainees

To conduct 2000 assessments during the project period, it was important to have an adequate number of trained persons. It was estimated that a minimum of 120 people would be required. Two incentives for participation were envisaged: public interest and professional training. Each trainee signed an agreement stating that the training would be free provided that he or she completed 20 risk assessments. If the assessments were not completed, the trainee would have to pay in order to receive the course certification.

IDEM took the lead in seeking trainees, and ISDH and the Institute publicized the courses and the 2000 Safer Families Program through its regular network. Many trainees came from state agencies. These agencies allowed their staff time on-the-job to conduct this work, although things many assessments were done after work hours or on weekends. Most of these people obtained training solely for the purpose of assisting with the project, and their energy and enthusiasm was commendable.

Several county health department employees participated. For many of them, the project was closely related to their regular work, and the training was necessary in order to meet state and federal training requirements.

Finally, a number of individuals working for private employers joined the project. The Indiana Society of Hazardous Materials Managers advertised the project to its members, and a few of them participated enthusiastically. Like the State employees, many of these Certified Hazardous Materials Managers did not specifically need the training, but viewed the objective as important. Finally, there were a few employees of private firms who took the training to achieve state certification.

Training Courses and Provider. The U.S. EPA training and accreditation rule (40 CFR 745) established the two types of professionals evaluating LBP hazards mentioned above. Lead inspectors use the XRF analyzer or other techniques to perform a surface-by-surface examination for the presence of LBP. These persons must take a specified 3-day course from an approved course provider and complete the examinations given both by the course provider and by the state of Indiana (using a federal exam model.) The Institute was one of the first training course providers approved in the Midwest by the U.S. EPA, and it subsequently secured approval for its courses from the states of Indiana, Illinois, and Kentucky. Thus, to become fully accredited (EPA) or licensed (Indiana), trainees must pass not only the course provider exam but also a third-party exam administered by the state. The IDEM Office of Air Quality, as the administering agent in Indiana, provided testing to trainees in the program and waived the normal testing and licensing fees. They also agreed to accept documentation from the Institute in lieu of the certificate which would not be provided until after the trainee completed the necessary number of risk assessments.

However, the decision had been made to perform risk assessments, rather than inspections. Thus, trainees had to not only complete the requirements for inspectors, but also take an additional 2-day risk assessor course and course exam, followed by completing the third party exam before they could be accredited. Thus, trainees entering the program made a commitment to take five days of training and to allow additional time to complete the third party examinations.

B. Obtaining Homes for Assessments

The task of finding 2000 individuals willing to have their residences assessed was a major one. The advertising was primarily handled by the IDEM Office of Pollution Prevention and Technical Assistance (OPPTA). They used a variety of means to try to promote this program. In a few locations, there was assistance from local housing agencies. IDEM prepared and distributed radio spots, leaflets, and news releases to inform Hoosiers of the availability of the free assessments. Some local housing agencies also informed individuals in their counties about the program. As a tie-in to IDEM's 5-Star Environmental Recognition Program for Child Care Facilities, it was decided to include child care facilities as locations for the assessments, since they also impact childhood health. ISDH also advertised the Program to participants in the Women, Infants and Children (WIC) nutrition program, which it administers.

Although some requests for assessments came directly to IDEM, the publicity was directed at having people call the state-wide Indiana Family Help-Line (IFHL) that is operated by ISDH. Operators at the hotline recorded the information from callers, and the ISDH Program contact provided this information to IDEM/OPPTA. ISDH and OPPTA then logged the requests and contacted accredited risk assessors in the relevant geographical area. The risk assessor would conduct a preliminary phone interview (using forms in Section 6, Appendix B) and would arrange a suitable appointment for the assessment. Since the assessments include the outside of the house, it was important to schedule them during daylight hours. The questions asked in the phone interview sought to determine whether the home was pre-1978 or not (since homes later than that should be lead-free); whether the occupant wished to have the water tested (see below); and how to get to the home. The assessor was also responsible for scheduling the person who would serve as monitor on the visit.

C. Assessing the Homes

After arriving at the home and introducing him- or herself to the occupant, the assessor would then complete the initial questionnaire. The assessor would then proceed to complete all relevant forms in the package as indicated below.

Assessment Forms

1. Initial Questionnaire

This form is used to gather information about the home and its occupants, including: the property's location, age, ownership and rehabilitation/renovation history; occupant owner or renter information, number and age of children, length of occupancy; potential water supply areas in industry lead hazards.

2. Property Diagram

This form is used to record the layout and use of rooms in the homes where wipe samples, paint chip samples, and soil samples have been taken. The diagrams are used to record the actual sampling locations. The designation of the rooms is used to indicate the locations for the paint condition matrix. The form is simply a lattice of dots to assist the assessor in laying out parallel lines and rectangular spaces. No particular scale is implied by the diagram.

3. Paint Condition Matrix

This form provides a standardized set of rooms and questions for the assessor to use to record her/his observations during the walk through. By standardized format speeds the input and simplifies the analysis.

Sample Collection and Analysis Request Forms

These forms are based on standard ISDH sample analysis request forms. We modified them slightly to indicate their use by the 2000 Safer Families program and simplify sample handling and reporting. Separate forms are provided for:

a. Dust wipe samples

The assessor must collect at least one dust wipe sample from the floor at the main entrance to the residence. Additional interior floors should be also sampled at other entrances and in rooms where paint was disturbed or deteriorated. Window sill and trough samples should be taken if there is evidence of frictional wear of the paint surface or the paint is visibly deteriorated.

Dust wipe samples were collected using non-aloe wet wipes rubbed across the surface in a standardized pattern. The area to be wiped is laid out prior to beginning the process and should ideally equal one square foot. However, window sills and troughs may require smaller areas to be sampled. The actual dimensions of the area sampled (in inches x inches or ft x ft) is recorded on the form. A few assessors collected dust wipe samples from miniblinds, since this has been identified as a source of lead in the home.

b. Paint chip samples

The assessor must collect pieces of visibly deteriorated or disturbed paint wherever found in the house, on the house, or on play equipment or fences outside the house. No specific size is required by the rule, but very small pieces (less than 1 square centimeter) may be difficult to analyze. Samples are not taken from intact paint or from friction surfaces that are not peeling.

c. Soil samples

Soil samples are taken from bare soil found either in play areas or in the general yard area. Separate composite samples and the composited samples are sent for analysis. Additional types of soil samples that could be collected include foundation area samples and garden area samples, although the U.S. EPA does not have standards applicable to either of these areas. Samples are not taken from soil that is covered with grass or ground cover. No destruction of hard surfaces (asphalt, concrete, etc.) is used to obtain soil samples.

d. Drinking water samples

High lead levels may indicate an area-wide lead problem, rather than a problem with the home being assessed. Area-wide lead problems put many children at risk.

EPA sampling protocols require that the water be taken from a drinking water source (cold water side) in the home, and that the faucet to be sampled must be sealed and allowed to stand at least eight hours before sampling. Since the assessor could not generally make two separate trips, the occupant was asked to select a faucet and tape it closed on the day prior to the scheduled assessment. The assessor then removes the tape from the faucet and collects the first liter drawn from the faucet. Our protocol then called for allowing the water to run until it was cool (indicating that it was coming from the supply pipes rather than pipes in the home) and drawing a second one-liter sample. Sample bottles for this analysis were provided by ISDH.

e. Assessors Findings and Recommendations

This form cannot be fully completed until the results are obtained from the laboratory.

D. Assessment Monitoring

Even before the project began, it was emphasized that a successful project would require that all risk assessors conduct their visual assessment and sample collection in a standardized format. Therefore, each risk assessor made two accompanied assessments (during their first ten assessments) so that her/his performance could be monitored and a more uniform set of assessments obtained. Although this was sometimes difficult logistically, it was usually followed and it was clearly needed. For most trainees, classroom instruction alone was not enough to produce high quality assessments.

E. Sample Analysis

The assessor assembled the necessary samples and accompanying paperwork and sent them to the ISDH laboratory in Indianapolis. The ISDH laboratory used validated U.S. EPA methods for analyzing the samples. The specific methods used were:

The assessor assembled the necessary samples and accompanying paperwork and sent them to the ISDH laboratory in Indianapolis. The ISDH laboratory used validated U.S. EPA methods for analyzing the samples. The specific methods used were:

1. Dust wipe sample method- NIOSH 9100, Lead in Surface Wipe Samples, and EPA 7420, atomic absorption, direct aspiration. The wipes are removed from their sample containers and placed into Erlenmeyer flasks. Loose solid material in the sample containers is washed into the same flask. The wipes are digested with acid on a hot plate. A portion of these digestates are centrifuged and analyzed by flame AA. The results are reported as milligrams of lead detected in the sample, or as milligrams of lead per square foot of surface area, if requested.

2. Paint chip sample method- ASTM E1645-94, Standard Practice for the Preparation of Dried Paint Samples for Subsequent Lead Analysis by Atomic Spectrometry, and EPA 7420, atomic absorption, direct aspiration. The paint chip samples are carefully weighed and then digested with acid on a hot plate. A portion of the digestate is centrifuged and analyzed by flame AA. The results are reported as percent lead (%Pb).

3. Soil sample method- EPA method 3050A, Acid Digestion of Sediments, Sludges, Soils and Oils, and EPA method 200.7, Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry. The soil samples are handled in manner similar to the paint chips. The results are reported in parts per million by weight (mg/kg or µg/g).

4. Water sample method- EPA method 200.8, Determination of Trace Elements in Water and Wastes by Inductively Coupled Plasma-Mass Spectrometry, or EPA method 200.9, Determination of Trace Elements by Stabilized Temperature Graphite Furnace Atomic Absorption Spectrometry. The sample is preserved with 5 mL of concentrated nitric acid. An aliquot is then analyzed by either of the above methods. The results are reported in ppb (µg/L).

II. Preparing and Submitting the Assessment Report

A. Initial Report Submission and Review

The assessor was responsible for filling out the first seven forms (3a - 3d above) completely and correctly. Where no information was available, this was to be clearly noted. After filling out the forms, the assessor submitted the forms to the Institute for review. The Institute added a Report Cover Sheet, recorded the preliminary report, copied it, and transmitted a copy to a specified reviewer for comment. The reviewer used the Reviewers Evaluation Form and Report Sheet to record the comments; scored the report as acceptable or unacceptable, and returned the form to the Institute. The reviewer's comments were returned to the assessor so the assessor would have them available when preparing the final report.

B. Final Report Submission and Review

When the assessor received the results from the laboratory, he or she was responsible for adding these to the report and completing the Assessors Findings and Recommendations. The completed, revised report was then transmitted to the Institute. The Institute recorded its receipt, copied it, and transmitted a copy to the same reviewer who had completed the initial review. If there were still problems, the reviewer was encouraged to work with the assessor to resolve problems, if possible. After receiving whatever corrections could be made, the reviewer scored the report as Acceptable, Marginally Acceptable (generally for early assessments by the assessor where he or she had failed to collect certain useful but noncritical information), or Unacceptable. A finding of Unacceptable could be corrected only if the original assessor was still available and was willing to collect or provide the necessary missing critical information. However, this was not always the case and some reports were never completed.

C. Final Disposition

After the reviewer completed the final review, he or she returned the annotated report and the Reviewers Evaluation Sheet and Report Form to the Institute. The results were recorded in the database, and a copy of the final report was transmitted to ISDH and the occupant. The ISDH copy included the Report Cover Sheet used during the review, but the occupant copy did not. The report, with the cover sheet, was filed at the Institute. Samples of the completed reports were later reviewed by an intern from Indiana University School of Public and Environmental Affairs and the results entered into a special database. Most of the results discussed in Section 4: Results were obtained from this database.

Section 4: Results

I. Training Delivery

The training goal had been 120 active risk assessors. However, only 81 active risk assessors were involved in the program, and four of those were Marion County Health Department inspectors who had been trained before the program began. These active risk assessors came from a number of different employers. Table 4.1 indicates the backgrounds and activities of these individuals. Refresher training was provided, where appropriate, for people previously trained.

Table 4.1: Agencies and Activity of Risk Assessors in the 2000 Safer Families Program.

Category	Assessors	Organizations	Assessments
Local Health Departments	32	18	718
State Agencies	36	5	461
Other Government	1	1	5
Industrial Corporations	4	4	22
Other Private Corporation	4	3	21
Other Nonprofits	5	3	65
Total	81	34	1292

Not surprisingly, the local health departments were responsible for the greatest number of these assessments. However, state employees also performed a large number of assessments. The average assessor performed almost 16 assessments, although three Marion County Health Department assessors provided over 400 assessments. The low number of assessments per assessor was partially due to the difficulty in getting homes/families to agree to a free risk assessment.

II. Risk Assessment Delivery

To reach 2000 homes, the project needed to generate at least 2000 requests. The total number of requests, though, only reached 1689, and many of those could not be performed. Table 4.2 below indicates what happened with each of these requests for assessments.

Table 4.2: Outcomes of Risk Assessment Requests During the 2000 Safer Families Program.

Comment	Sites	Percentage
Completed	1292	77%
no return calls	222	13%
changed mind	118	7%
requested info only	35	2%
Unable to complete	22	1%
Total	1689	100%

As indicated above, only 22 of the assessments were initiated, but not completed; which represent only 1% of the requests. The need to schedule assessment appointments also created problems, as 340 persons either failed to return the assessors' calls or replied that they had changed their minds.

The greatest completion rate was the visits generated by the local health departments from their own jurisdiction and by IDEM OPPTA as a part of the child care facility visits. Efforts to gain interest from individuals were much more difficult. It is not clear what steps could have been taken to generate more requests other than possibly greater involvement by local health departments.

Due to low interest in or awareness of the available assessments among the target population, not every assessor could complete 20 assessments. If this were repeated today, a fertile source of clients and assessors might be HUD-related agencies and non-profit corporations. As a result of HUD regulations that went into effect on September 19, 2000, risk assessments are required in a wider variety of Indiana residences, and homeowners and HUD grant recipients might be more willing to come forward.

Figure 4.1 shows the distribution of the 1292 reported risk assessments through the state. This represents 181 cities and 79 of Indiana's 92 counties. Table 4.3 lists the number of assessments conducted per county during the program.

Table 4.3: Assessments Completed, by County

County	Assessments	County	Assessments
Adams	1	LaPorte	2
Allen	76	Lake	66
Bartholomew	10	Lawrence	4
Benton	1	Madison	5
Blackford	3	Marion	562
Boone	9	Marshall	2
Brown	3	Miami	9
Carroll	4	Monroe	15
Cass	2	Montgomery	3
Clark	10	Morgan	1
Clay	3	Newton	1
Clinton	29	Noble	5
Crawford	2	Ohio	3
Daviess	5	Owen	2
Dearborn	1	Parke	3
Decatur	1	Perry	4
Dekalb	7	Pike	3
Delaware	29	Porter	8
Dubois	1	Posey	2
Elkhart	68	Putnam	2
Fayette	1	Rush	1
Floyd	14	Scott	2
Fountain	3	Shelby	6
Franklin	3	Spencer	5
Fulton	1	St. Joseph	69
Gibson	6	Steuben	3
Grant	3	Sullivan	2
Greene	5	Tippecanoe	36
Hamilton	6	Tipton	1
Hancock	8	Union	1
Harrison	1	Vanderburgh	57
Hendricks	7	Vermillion	1
Henry	12	Vigo	9
Howard	8	Wabash	3
Huntington	3	Warrick	5
Jackson	2	Washington	8
Johnson	7	Wayne	15
Knox	5	Wells	2
Kosciusko	1	Whitley	2

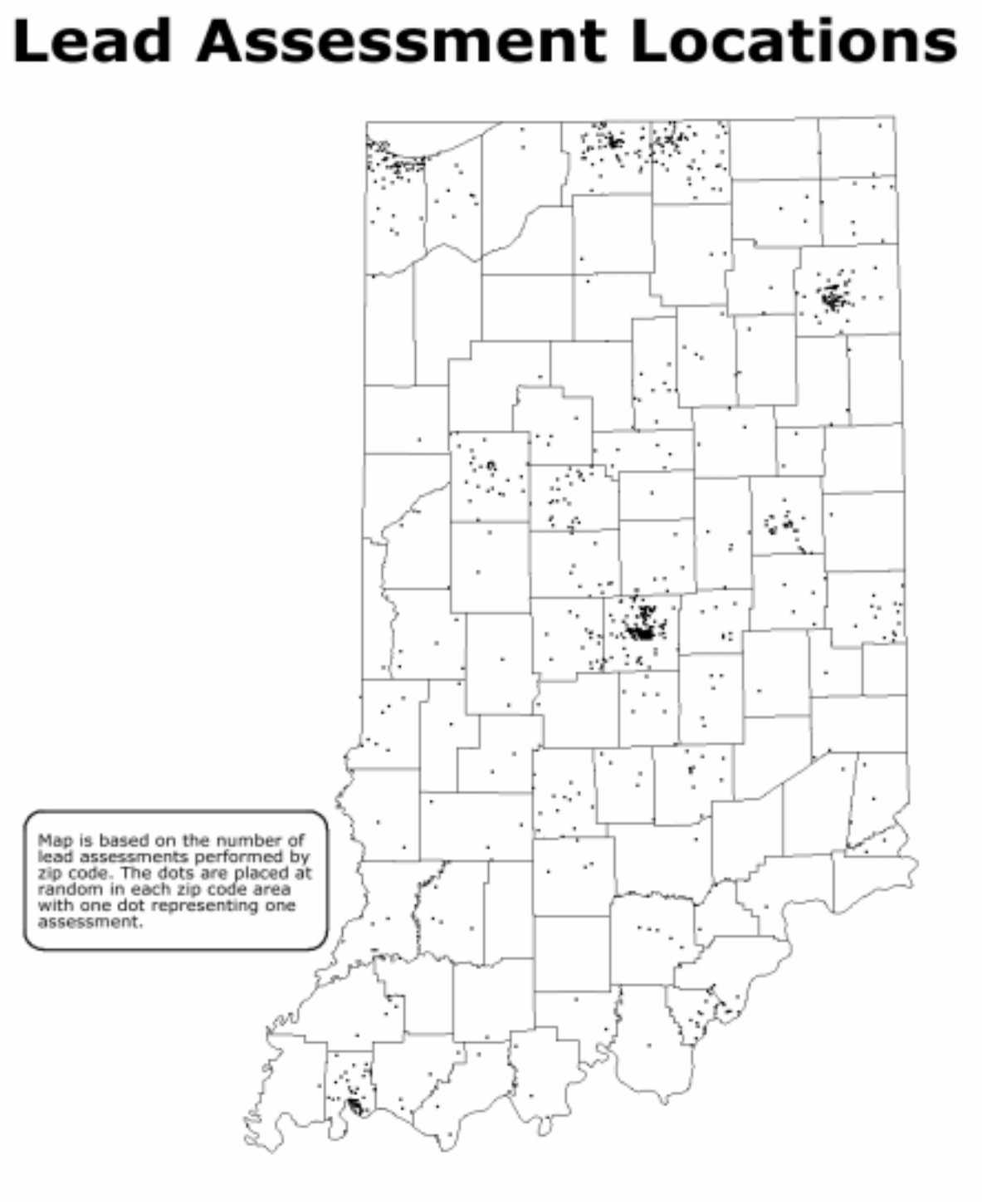

Figure 4.1: Lead Assessment Locations

III. Sampling and Analysis: ISDH Laboratory Results

In preparation for this report, a subset of the data generated through the Institute's efforts was analyzed. This subset covers a generous portion of the state-wide data, although it does not include all sites visited. However, it is believed that the data are generally representative of those collected during the assessments. Table 4.4 shows the total number of samples considered for each type during the data analysis phase. It also includes the highest level found in the study and compares that to the respective regulatory cut-off. Notice that there are no regulatory cut-offs for many types of samples taken. These maximum levels clearly raise a red flag, but it is important to remember that they are unrepresentative of the data as a whole, and a more complete picture can be seen in the data charts provided below.

Table 4.4: Samples Reviewed for Overall Results.

Item	Samples Analyzed	Maximum Level	Regulatory Cutoff	Units
Dust wipes	2,326			ug/ft2
Blanks	284	90		
Floors, carpeted	122	220	40	
Floors, hard-surface	467	13,900	40	
Miniblinds	29	6,830		
Windows, sills	426	72,270	250	
Windows, troughs	213	321,250	400	
Windows, unspecified part	83	83,333		
Others (unclassifiable)	702	34,300		
Paint chips	928			%
Interior	387	46		
Exterior	384	29		
Soil samples	373			ppm
Foundation area	65	18000		
General yard	235	32000	1200	
Play areas	73	1300	400	
Water samples	490			ppb
Drinking faucet	432	41	15	
Other source	58	34		

A. Dust Wipe Samples

By far, the most common type of samples collected are dust wipe samples, as there were 2326 wipe samples analyzed in this subset alone. As mentioned in Section 3, assessors must collect dust wipe samples at each property, but soil samples, paint chips, and drinking water samples are collected only where problems are observed. Under the protocols in place for the study, only floor wipes were mandatory, so these predominate in the report. As shown in Figure 4.2, they account for over half the samples collected at specified locations.

To interpret the results of dust wipe sampling, we must compare them to standards set for dust-lead hazards. Table 4.5 lists the HUD/EPA standards that were in effect in 1998 (that is, in effect at the time of the study) along with the standards that went into effect in January 5, 2001.

Table 4.5: HUD/EPA Dust-Lead Hazard Standards.

Component	1998	2001	Units
Floors	100	40	ug/ft2
Window Sills	500	250	ug/ft2
Window Troughs	800	400	ug/ft2

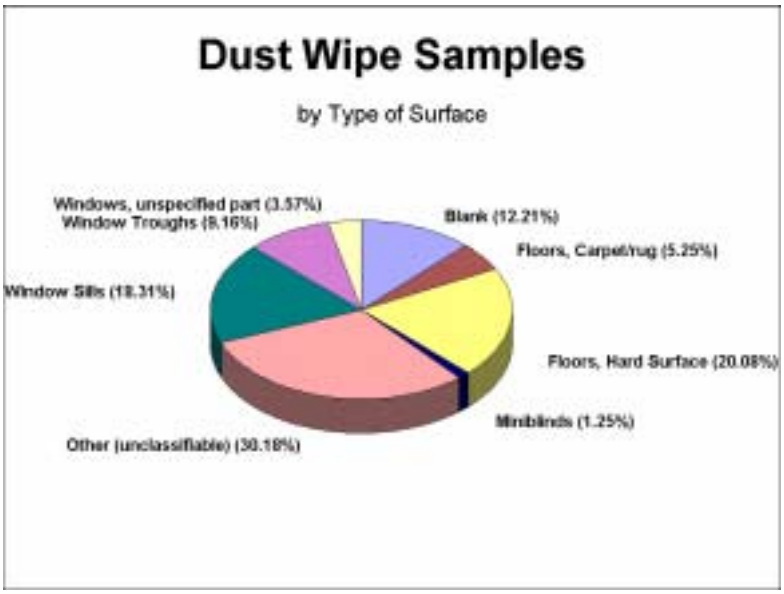

Figure 4.2: Relative amounts of different types of dust wipe samples analyzed.

Figure 4.2 summarizes the types of wipe samples collected.

The most remarkable revelation on Figure 4.2 is that over a third of the samples reviewed were documented so poorly that it could not be determined which standard should be applied (floor, window, etc.)

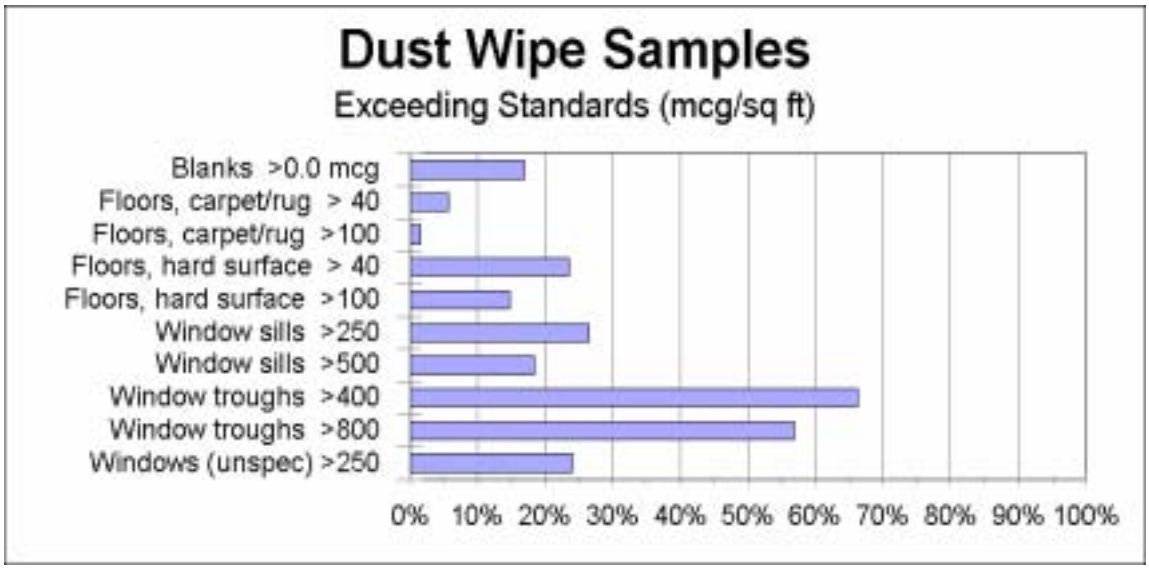

Figure 4.3: Percent of dust wipe samples failing the relevant standards.

From Figure 4.3, it is immediately evident that a significant number/portion of floor wipe samples fail both the new and the old lead-dust hazard standards. The failure rate on hard surfaces is much larger than on carpet, which may reflect the ability of carpets and rugs to hide the lead dust beneath the surface. However, the hazard is still present in a child's environment and may be released during activities in the home.

An even larger fraction of the window samples fail, especially in the troughs, where fully two-thirds (2/3) of the samples are above the 2001 standard, and over half exceed the 1998 standard. It should be noted, though, that this larger failure rate for window samples probably reflects a bias: the risk assessor need not sample windows unless there is evidence of disturbance or deterioration. Some of the highest levels indicate that high-lead paint chips (and the resulting dust) account for much if not all of the dust in the trough.

B. Paint Chip Samples

Risk assessors must collect paint chips from areas of clearly damaged, disturbed, or deteriorated paint. However, they need not collect paint chips from friction and impact surfaces (such as doors or windows), so long as they collect relevant dust wipe samples in the area. A paint chip is considered to be lead-based paint if the level of lead exceeds 0.5% (5000 ppm) by weight. A lead-paint hazard exists where LBP is present and the paint is damaged, disturbed, or deteriorated, including on friction surfaces, impact surfaces, and chewed surfaces.

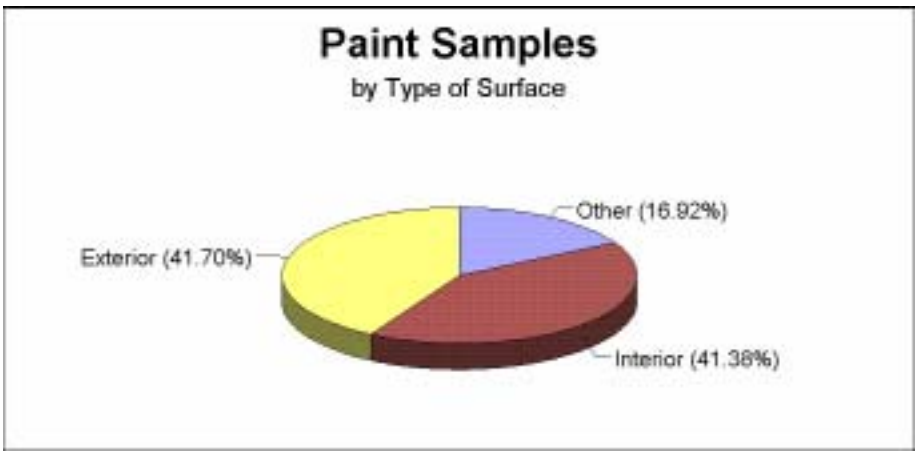

Figure 4.4: Distribution of paint chip samples reviewed.

Again, Figure 4.4 indicates that risk assessors did not always adequately identify the sample locations from which paint chips were collected. In this case, approximately one-sixth (1/6) of the samples are of indeterminate origin.

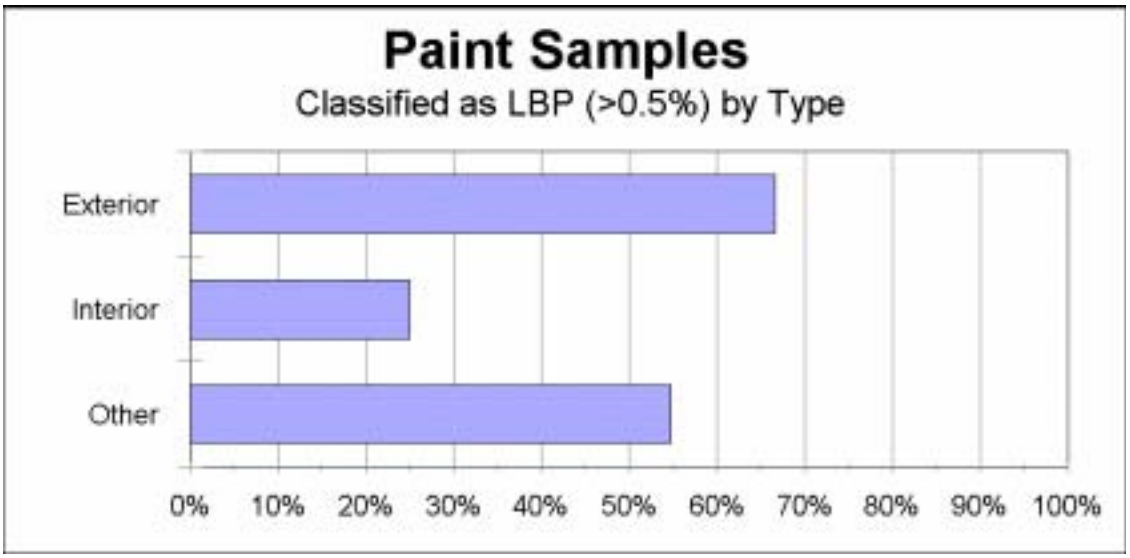

Figure 4.5: Paint chip samples exceeding the 0.5% definition of LBP.

This work clearly indicates what inspectors have reported: exterior paint is far more likely to be LBP than is interior paint. Interior paints clearly began to have a diminished lead content by World War II, but the level in exterior paint only began to decline only during the 1950s.

C. Soil Samples

The old HUD inspection guidelines called for soil samples to be collected from bare soil in the foundation area of the house (at the drip-line) and in the play areas. However, EPA now calls for soil samples outside the play areas to represent the general yard. Unlike wipe and paint samples, soil samples generally represent composite samples. Figure 4.6 shows the various types of soil samples collected during this study.

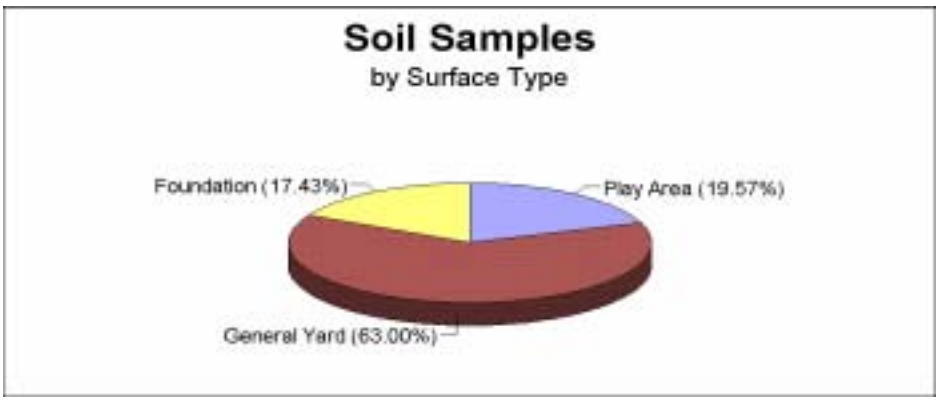

Figure 4.6: Distribution of soil samples reviewed.

The pre-2001 soil sample criterion was 400 ppm in the play areas and 2000 ppm for other soil samples, with a mandatory removal at 5000 ppm. In January 200, EPA announced a 1200 ppm standard for the general yard, but left the play area standard at 400 ppm. Figure 4.7 shows the percentage of soil that fails the analysis. Again, this may overestimate the fraction of Indiana homes with problems, since the assessor is not required to take soil samples unless there is bare soil with which the child might come into contact.

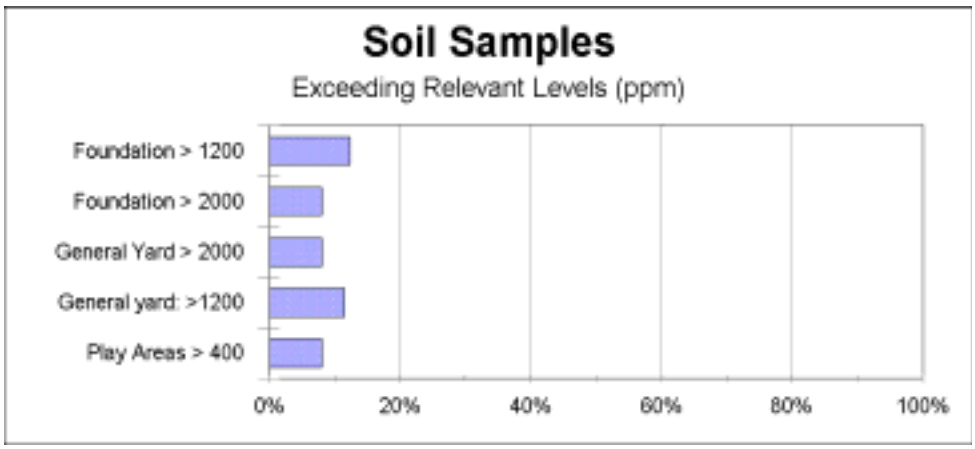

Figure 4.7: Soil lead hazards found in reports reviewed.

The data indicate that soil lead hazards are less common than dust or paint hazards.

D. Water Samples

Water samples were collected during the risk assessment whenever the occupant indicated during the initial phone interview that they wished to have a sample collected and agreed to identify and control the use of a drinking water faucet. Since there was no way to ensure this control had been exercised, the results may be skewed downward. Figure 4.8 shows the distribution of the locations from which the water was taken.

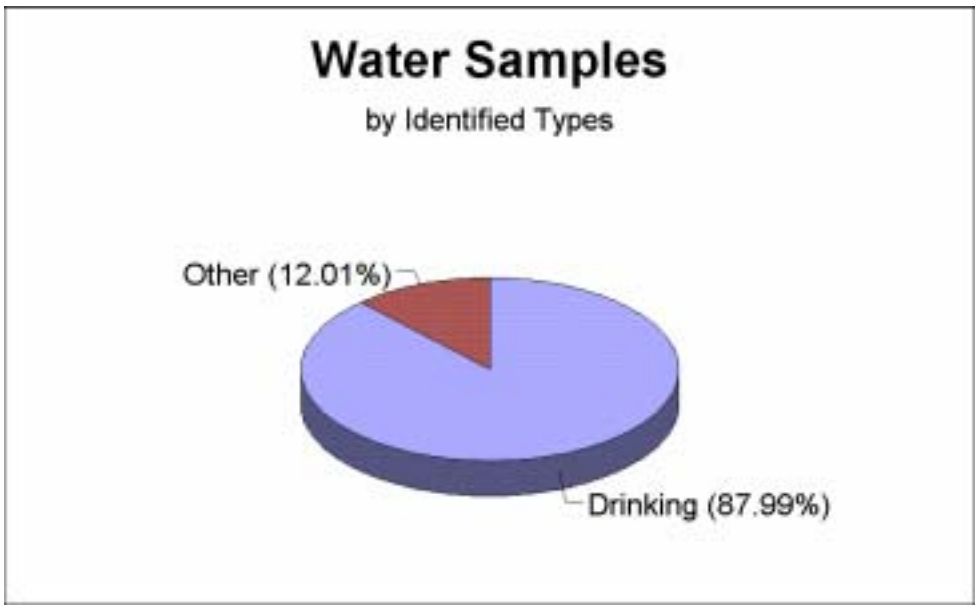

Figure 4.8: Distribution of water samples reviewed.

The other category in Figure 4.8 includes both samples collected from some place other than a drinking water faucet and samples for which no location was stated.

The drinking water standard requires the public water supply company must be able demonstrate a 95% probability that the level of lead in first draw water will not exceed 15 ug/dL (15 ppb). Since we collected only one sample from each location (or occasionally, a second draw sample as described in Section 3: "Executive Summary" starting on page 11), we have used the 15 ppb as an absolute standard.

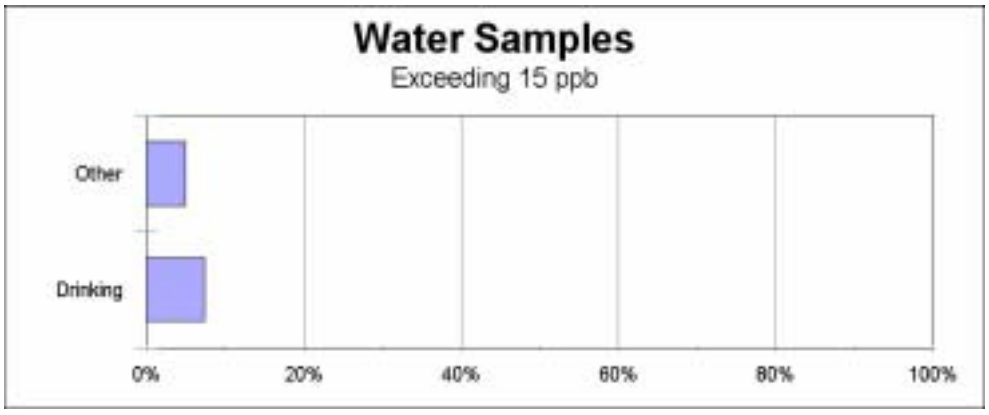

Figure 4.9: Hazard levels identified in drinking water samples.

As described above in Figure 4.9, Indiana drinking water samples tend to be low in lead because of the high calcium and carbonate levels found in our water, whether from underground or surface sources. Thus, it was typical to find only low levels of exceedance. It is important to note that 18 of the highest water levels in the 518 samples reported are not included on these data because comments on the ISDH laboratory report suggested that there may have been problems in the analysis. If these samples were included, the number of samples exceeding the standard would have doubled. But, more importantly, the maximum sample included would shift from 41 in this data set to 3200 in the complete data set. The questionnaire used had no information about the source of the drinking water sampled (that is, whether municipal or private well). Because of the paucity of data, no geographical analysis of the high lead level samples was undertaken.

IV. Sampling and Analysis: MCHD Laboratory Results

The Marion County Health Department laboratory also ran analyzes of risk assessment samples and provided the data to us for this project. The results reported here are summarizations of the 1725 samples reported by the laboratory. Because of differences in reporting, the data cannot be presented in the same way, but the results present a similar picture to that delineated in the ISDH results.

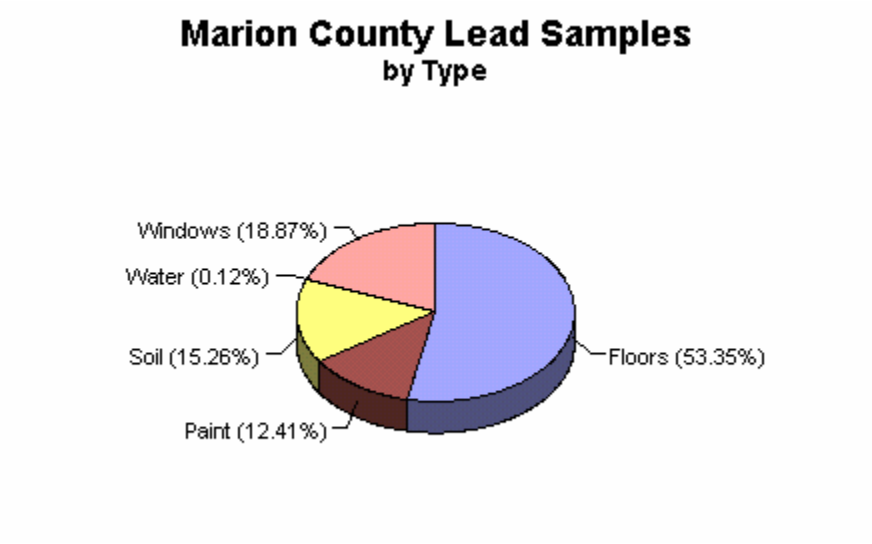

Figure 4.10: Distribution of Samples Analyzed.

Again, floor dust wipes dominate the samples taken, since that is the basic tool of the risk assessor. The results of these floor wipe samples are summarized in Figure 4.11 and Figure 4.12. As we saw in the state-wide data, carpets appear to absorb lead: The results appear even more striking here, though, since no carpet samples exceeded the standard. However, as shown in Table 4.6, very few dust wipe samples on carpeted floors were taken and reported.

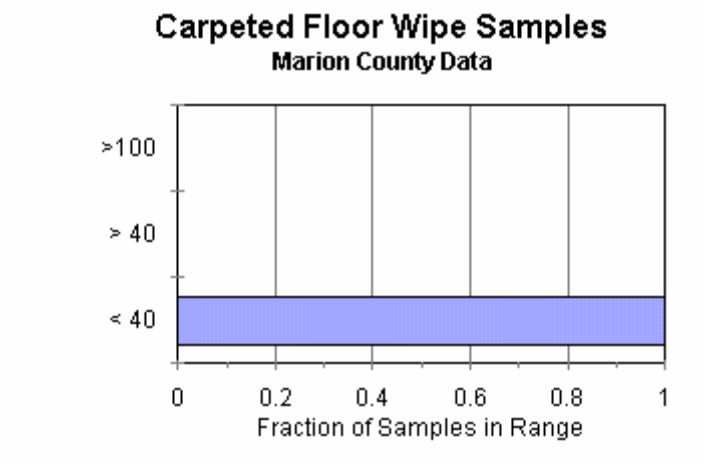

Figure 4.11: Lead levels in samples from carpeted floors.

Table 4.6: Distribution of Marion County Laboratory Analyzes.

Medium	Type	Analyzes
all		1725
floor	Carpeted	6
floor	hard-surface	910
paint	Exterior	179
paint	Interior	34
soil	Foundation	24
soil	general yard	229
soil	play area	9
window	Sill	32
window	Trough	265
window	(unspecified)	54
water		2

Many samples were taken on hard-surface floors and these results are shown in Figure 4.12.

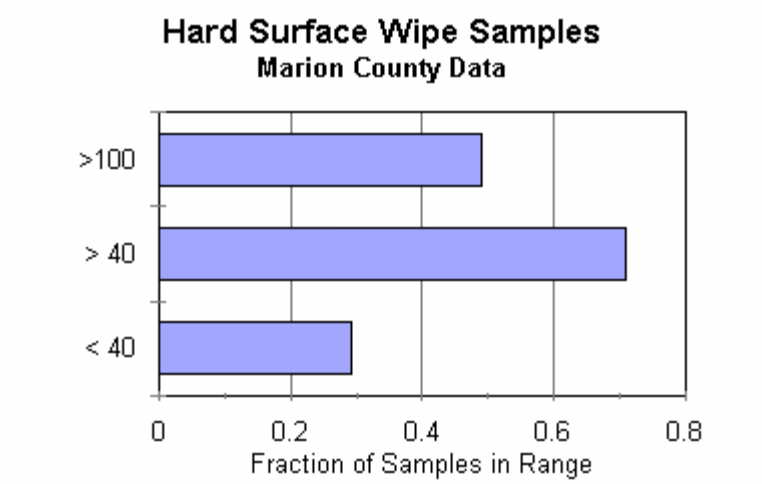

Figure 4.12: Lead levels in samples from hard-surface floors.

The levels found here are much larger than were found in the state-wide study. Here, almost 70% of the samples exceed the current limit, nearly three times the levels found state-wide. However, since most of the MCHD samples are taken as parts of investigations, either in homes inhabited by an EIBLL child or in neighborhoods known to have many EBLL children, the distribution is certainly skewed. Concerned parents (those most likely to request the free assessment) may also be better at maintaining a clean house, further skewing the data.

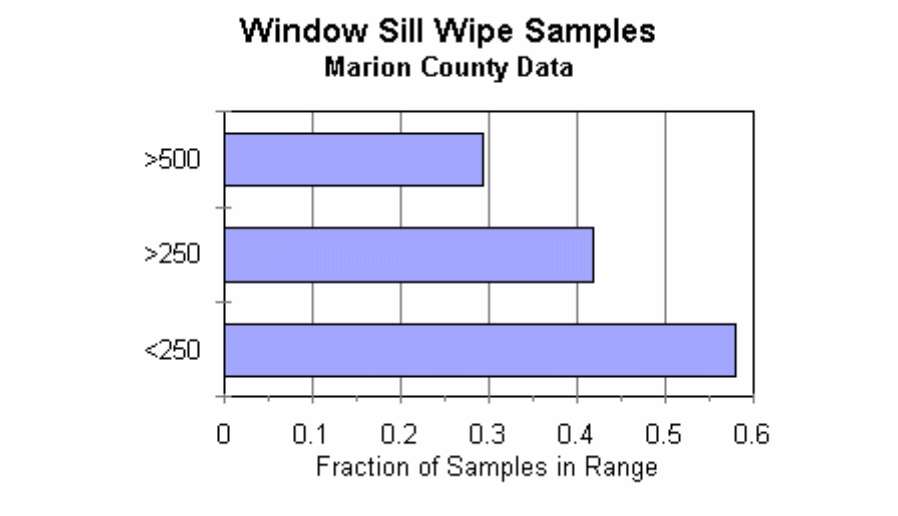

Figure 4.13: Lead levels in samples from window sills.

In Figure 4.13 we see that the window sill levels found during Marion County data are significantly higher than in the state-wide study, although by only a factor of two rather than a factor of three.

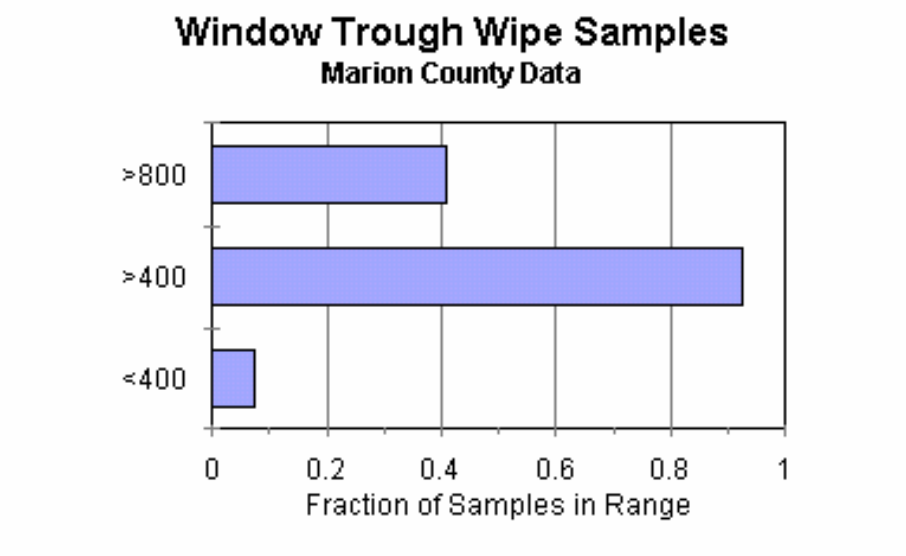

Figure 4.14: Lead levels in samples from window troughs.

Figure 4.14 shows the levels found in the window troughs and continues the trend of MCHD data's running higher than state-wide assessments.

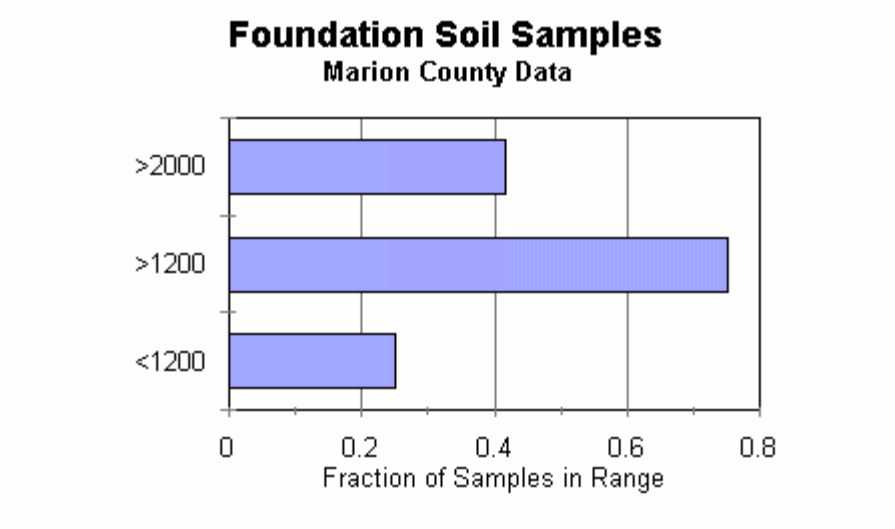

Figure 4.15: Soil lead levels from foundation areas.

Soil samples taken from within the drip-line of the eaves were formerly a common risk assessment technique. However, the EPA, in its more recent guidance, has divided the bare soil areas of the yard into two types: general yard and play areas. Thus, foundation soil samples may be considered part of a play area if there is evidence of use for play by children. The 1200 ug/ft2 limit used on the data in Figure 4.15 is suitable for general yard assessments; the lower 400 1200-ug/ft2 limit is used for play areas. About two-thirds of the samples fail the more generous limit, which is far in excess of the 10-20% of state-wide assessments which were performed. This high level probably results from accumulated paint chalking debris, but it may have resulted from renovations of the area.

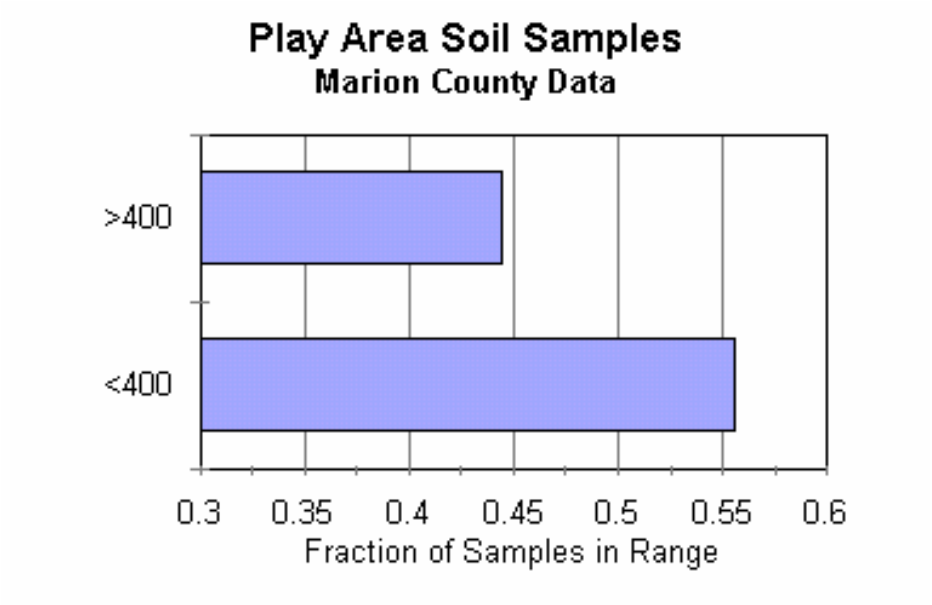

Figure 4.16: Soil lead levels from play areas.

Soil levels are high not only near the foundations, as almost 45% of the samples from play areas exceeded the EPA limits, as shown in Figure 4.16. Thus, there seems to be heavy lead contamination at properties represented by the MCHD data. This is further borne out by the general yard data displayed in Figure 4.17. Over 20% of these samples exceed applicable limits, whereas only about 10% of the state-wide samples were this high. It should be noted that areas along urban streets often have levels this high because of accumulated residues from leaded gasoline combustion. Play areas area sometimes found to be high because leaded anti-corrosion paint was used on play equipment.

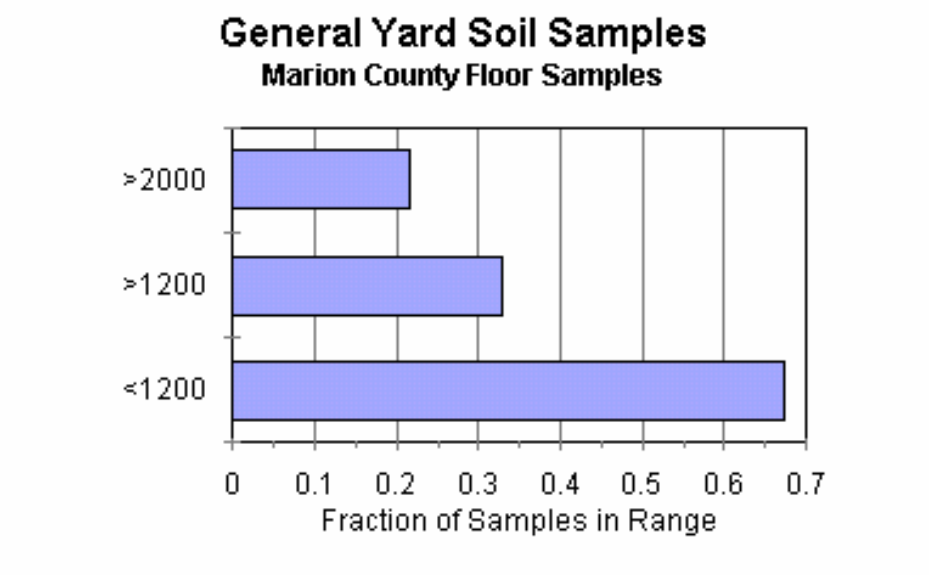

Figure 4.17: Soil lead levels from general yard areas.

Section 5: Conclusions and Recommendations

I. Conclusions

As a result of the 2000 Lead-Safe Families for 2000 Program, almost 1300 Indiana households now have the information needed to respond to lead hazards. In addition, almost 40 employees of Indiana health departments received the training and experience they need to carry out their role in assisting families of children with elevated blood levels.

The numbers are clear: only 1300, not 2000, families were reached by the program (although at a per-household cost roughly in line with the initial estimates, since payment to the contractor was based on completions.) However, the 1300 families make this the most successful program in the nation of its kind, because no other similar effort has been taken in the United States. With no previous model to follow, the various agencies and individuals involved worked through problems that were encountered and kept the program moving forward toward its goal. The two major deficiencies, too few persons coming forward to be risk assessors and too few owners/occupants seeking assessments were not under the control of the project managers. Any future program must address strengthening these recruitment issues.

The fruits of the effort did not end with the last risk assessments. Several groups and individuals are now better equipped to deal with lead-based paint poisoning concerns in Indiana:

1. Several health departments have individuals trained, licensed, and ready to perform risk assessments whenever a lead-poisoned child is identified by the healthcare system;

2. The IDEM Lead Licensing Branch has worked through its EPA approvals and has managed the testing and licensing of a large number of individuals;

3. The ISDH laboratory has successfully managed a very large volume of samples and has identified key factors for successful analysis of risk assessment sample requests;

4. The Institute has developed, field-tested, and made available to Indiana risk assessors a standardized set of forms for conducting and reporting a risk assessment; and

5. A large number of individuals and organizations have been sensitized to the genuine threat of lead poisoning to young children. This sensitization has been obvious during the past two years, as Indiana housing agencies have been working to incorporate lead-safe work practices into rehabilitation, renovation, modernization, and weatherization programs. Several key individuals in the current effort were first involved with lead issues during the 2000 Safer Families Program, and the experience gained and lessons learned have been important to the success of the current effort.

II. Recommendations

A. Training and Licensing

Indiana requires annual renewal of training and licensing. To continue to assist Hoosier agencies in protecting children, direct support for state and local employees in maintaining their training and licenses is important. While there currently is a funding mechanism in place, it will expire before the end of the 2001.

B. Obtaining Homes for Assessment

IDEM - OPPTA initially handled the major burden among the state agencies to obtain occupants who could benefit from an assessment. Now, other state agencies have major lead-control programs underway, to include Family and Social Services Agency (FSSA), and the Indiana Housing Finance Authority (IHFA). Both FSSA and IHFA would now make natural partners for assisting with identifying homes for risk assessments for future efforts. In addition, Improving Kid's Environment, a non-profit advocacy group for children's environmental health, has been working closely with a number of community groups throughout the state to raise the level of lead awareness. Local health departments are also now more experienced with these assessments and would be better able to help spread the word. If this project was to be repeated today, most assessors and clients might be HUD-related agencies and non-profit organizations. Thus, any future effort should be coordinated with these groups wherever possible.

C. Scheduling and Tracking the Risk Assessments

It is clear that one of the most difficult logistical problems was in coordinating the occupant and the risk assessor. Addresses and phone numbers supplied for assessment locations were sometimes incorrect or incomplete, and the person requesting the assessment was not always the person who would allow the risk assessor entry to the house. Finding a suitable risk assessor to go to a particular residence was made even more difficult because there was no subsidy to risk assessors for their travel costs. This meant that it was much harder to reach some parts of the state. In areas where local health departments could respond, there was less difficulty in scheduling and completing the visits.

A better system for tracking incoming calls, matching calls to assessors, providing travel subsidy for assessors, and ensuring that scheduled assessments occur should be included in any future program. It is revealing that in the outcomes table (Table 4.2), there is no category for "Client did not appear at scheduled time," although it is clear from anecdotal evidence that this did occur.

D. Sampling and Analysis

A number of changes occurred in the course of the program that should be incorporated into the protocols in the future. The American Society for Testing and Materials has now issued a standard for wet wipe dust sampling, which make the dust wipe analysis simpler and faster. The sample request form was changed to improve the accuracy of the reporting, and some additional changes would also be in order based on the review of results from the assessors. The protocol for transmission of samples was not clear to the risk assessors, and this often delayed submission, and hence analysis. Finally, the sheer volume of samples delivered overwhelmed the system and resulted in delays in analyzing samples and reporting results. Much more attention to these details is needed for future work in this area.

Reporting.

It is clear that, even with the training and monitoring program, risk assessors adapted only slowly to the standardized report forms. However, the assessors who used the forms regularly and carefully found them to improve rather than hinder their work in the field. The poor handling of sample location information resulted in almost a quarter of the samples being indeterminate. Changing the analysis request forms can improve this, in part, but will not solve it entirely. A better tracking system to ensure that reports and samples come back in immediately after the assessment visit, and that the accuracy and completeness of these preliminary reports is checked quickly would solve most of these problems.

E. Project Management and Coordination

Each of the cooperating organizations worked mightily to keep the project on track, and without that consistent effort, the project could never have been completed. More planning and better central coordinator for this group project would have assisted in keeping the project on track. This is a common difficulty when several agencies and organizations interact to complete a project. Regardless, the 2000 Lead-Safe Families for 2000 program was the first broad-based lead program of its kind in the nation, and over 1300 families benefited from this multi-agency cooperation.

The Top Ten Things you Need to Know to Keep your Family Lead-Safe

10) If your home was built before 1978, it could have lead hazards.

9) Lead poisoning interferes with your child's normal mental development.

8) Ensure that your child's blood lead level is checked by age two.

7) Eat a healthy diet full of foods high in calcium & iron.

6) Be careful: Improperly performed renovations can poison your child.

5) Cleaning with a dry rag spreads dust (except specialized High Efficiency Particulate Air (HEPA) vacs).

4) Solve moisture problems to reduce paint deterioration.

3) Fix deteriorated paint using lead-safe methods.

2) Wet cleaning with detergent is effective (but discard rags, mops, etc.).

1) Lead poisoning is 100% preventable.

IDEM

Indiana Department of Environmental Management
Children's Environmental Health
www.in.gov/idem/kids

Indiana State
Department of Health

Section 6: Appendices

I. Participants

A. Participating Risk Assessors

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Edwards, Audley
Fischer, Ron
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Galbraith, Matthew
Galvan, Cynthia
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Goy, Keith
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Haag, Lawrence J.
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Hockett, Phyllis M.
Johnson, Jorie K.
Johnson, Tamara
Judy, Ray
Keaton, Sue
Ketenbrin, Earl
Kirby, Tereasa
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Lawrence, David
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Meals, Kimberly R.
Mercado-Feliciano, Minerva
Meszaros, Joseph
Musgrave, Ken
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Orzech, Bob J.
Payne, Douglas
Pettigrew, Tamika
Porter, Anita
Price, Lewis
Reilly, Joshua
Rich, Craig A.
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Indiana State Department of Health (ISDH).

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David McCormick
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Joan B. Ketterman
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Paul Sapoff
Harry K. Armour
Andrew C. Harmon

CHC Technologies, Inc.
William Higgins
Michele Crider

Indiana University School of Public and Environmental Affairs
Sara Westrich

II. Forms Used During the Project

Forms Used by Risk Assessors

1. Initial Questionnaire & Risk Assessment Permission Agreement
2. Property Diagram
3. Paint Condition Matrix
4. Water Sample Analysis Form – Chemical Examination of Water
5. Soil Sample Analysis Form - Chemical Examination of Soil
6. Lead Sample Submission Form – Dust Wipes
7. Lead Sample Submission Form – Paint Chips
8. Risk Assessor's Final Report and Recommendations

Initial Contact Interview

Site _____ Date _____ Assessor _____

Residence Information

Contact Person _____

Address _____ Apt. No _____

City/State/Zip _____

Telephone _____

Dwelling Type ___ attached single family ___ apartment
___ detached single family ___ daycare center
___ school ___ other

Occupancy Type ___ owner-occupied ___ in-home childcare
___ Section 8 ___ private rental ___ public housing ___ other

Contact Person's Relationship to Residence

____ Owner ____ Renter ____ Resident, not owner or renter

Year of Construction of Residence _____ (check at site)

Time in Current Residence _____ years or _____ months

How Long Since the Last Remodeling/Repainting That Disturbed:

interior paint ___ years *or* ___ months (0 months for work in progress)

exterior paint ___ years *or* ___ months (0 months for work in progress)

Has This Residence Been Cited for Code Violations or Failure to Meet HUD Minimum Standards? (What for, when?)

Would you describe the building's current condition as

___ Excellent (no deterioration)

___ Good (minor paint problems)

___ Fair (paint problems including substrate failureor extensive peeling)

___ poor (structural problems)

Family Information

List the ages of all children who reside here.

_____yr _____yr _____yr _____yr _____yr _____yr _____yr

List the ages of all additional children who are here at least 6 hours / week.

_____yr _____yr _____yr _____yr _____yr _____yr _____yr

Do any of these chilren eat or chew on non-furniture items

_____ yes _____ no _____ don't know

Does the child have favorite outside play areas

_____ yes _____ no _____ don't know

If yes, please describe briefly

Has any person in the home ever been diagnosed as having an elevated blood lead level?

_____ yes *(ask additional questions below)* _____ no _____ don't know

Who has been diagnosed? (adult? child? age?)

How was this diagnosis made?

Has this person been treated?

Initial Contact Interview

General Information

Do you know of any previous lead inspection or risk assessment for this property?

_____ yes _____ no _____ don't know

If so, will a copy be available for me when I visit?

_____ yes _____ no _____ don't know

Does any member of the family work in a lead-using industry?

_____ yes _____ no _____ don't know

Are there any industries using lead within 1 mile?

_____ yes _____ no _____ don't know

Does any member of the family have a craft/hobby using lead?

_____ yes _____ no _____ don't know

Do you have old cans of oil-based paint stored in the house?

_____ yes _____ no _____ don't know

Do you have any reason to believe that your house contains hazards from lead-based paint or any other source of lead?

_____ yes _____ no _____ don't know

Do you or any member of your family use any nonprescription medicines or dietary supplements (other than regular over-the counter vitamins or medicines)?

_____ yes _____ no _____ don't know

If yes, please list:

Water Analysis

Are you on a public water supply system

_____ yes _____ no _____ don't know

Have you recently had any plumbing done on drinking water supply pipes in or near your home?

_____ yes _____ no _____ don't know

Do you want us to collect a drinking water sample for analysis while we are there?

_____ yes _____ no

If you want to have us collect a water sample, it is very important that we collect what is called "first draw" water. First draw water is water which has stood in your household piping system long enough to allow it to begin dissolving lead from pipes, fixtures, and solder (if any lead is present in them).

Therefore, before we are scheduled to arrive, you must select a faucet (a bathroom tap is often the most convenient) from which you draw drinking water but which you can shut off ***and tape the handle to discourage use*** and leave shut off for ***at least eight hours before our arrival.***

Regardless of whether or not you do this, we will collect a water sample, but if the faucet has been allowed to run before our arrival (as indicated by the absence of being taped shut), we will not be able to get a valid sample and your water may have more contaminant than the laboratory report indicates.

Appointment scheduled for:

Lead Risk Assessment Permission Agreement

I _____ (printed name)

have requested a lead risk assessment for my residence / property (circle one or both, as applicable)

located at:

Street Address: _____

Apartment Number: _____

City, Zip Code: _____

Telephone Number: _____

The owner of record for this property is:

Name(s): _____

(Complete the following if it is different from the above; otherwise indicate "same")

Street Address: _____

Apartment Number: _____

City, Zip Code: _____

Telephone Number: _____

I consent to the assessment of my dwelling for lead. I assume responsibility for the minor damage that may occur incidental to this assessment activity. I understand that I will receive a copy of the completed assessment and that I will not be obligated to fulfill any recommendations made.

Signed: _____ **Date** _____

Version 1.0

Lead Risk Assessment Site Description

Site_____ Date _____ Assessor_____

Area diagrammed: ____ floor ____ basement ____ attic or storage area ____ exterior only (show property boundary)

Standard Abbreviations for Use

BdR	bedroom
CBdR	children's bedroom
MBdR	master bedroom
BthR	bathroom
DR	dining room
Gar	garage, carport
KT	kitchen
LR	living room, den, family room
Mch	mechanical (furnace, water heater)
PA	play area
Str	storage area (closet, pantry, shed)
Utl	utility (laundry room, workroom)

Site Notes:

Version 1.0

Risk Assessment Grid

Site Address _____ **Date** _____ **Assessor** _____

Building Component	Present at site?	Indicators of Building-Related Lead-Based Paint Hazards				
		Location Notes*	Paint Condition**	Friction or Impact?	Moisture?	Visible Bite Marks?***
Exterior Siding						
Exterior Trim						
Exterior Windows						
Exterior Doors						
Exterior Railings						
Porch Floors						
Other Porch Surfaces						
Interior Doors						
Ceilings						
Walls						
Interior Windows						
Interior floors						
Interior trim						
Radiator/Cover						
Stairways						
Cabinets, Kitchen						
Cabinets, Bathroom						

* If the overall condition of a given component is similar throughout, write "ALL" in location notes. Otherwise, list the specific sites being described and note them on the site description drawing. The back of this page may be used for narrative comments; be sure to photocopy **both** sides when submitting your final report.
** Record paint condition as intact, fair, poor, or not present.
*** Record all locations with bite marks.

Risk Assessment Grid

Narrative Comments

Check Space	INDIANA STATE DEPARTMENT OF HEALTH	Do not write in this space
☐ Branch ☐ Dental ☐ Eng. Div. ☐ Other _____	Environmental Laboratory 635 N. Barnhill Drive--Rm 13G P.O. Box 7202 INDIANAPOLIS, INDIANA 46207-7202 **CHEMICAL EXAMINATION OF WATER**	Lab No. _____ Date Rec. _____ Date Rep. _____

FILL IN THIS SPACE. USE SOFT PENCIL
Indiana State Department of Health is to mail report to:

(Name)

(Street) IN

(City or Town) (Zip)

Also, mail copy of report to

(Name)
ISDH - MCH – Childhood Lead Poisoning Prevention Program

(Street) IN

(City or Town) (Zip)

Name of Utility of Organization _____ Supt. _____

City or Town _____

Collected by _____ Date Collected _____ Hour _____

Where was sample collected? _____ Bottle No. _____

Name unusual conditions _____

PWS Identification Number _____

FIELD INFORMATION		LABORATORY INFORMATION					
Indicate all treatment this sample has received	***Check***		***Check***	***Do not Check mg/l***		***Check***	***Do not Check mg/l***
No treatment	X				Arsenic		
Chlorination					Barium		
Plain sedimentation		Turbidity			Cadmium		
Aerated and settled		pH			Chromium (total)		
Potassium Permanganate					Lead	X	
Coagulant Aide		Hardness as CaCO3			Mercury		
Prechlorinated		MO Alk. as CaCO3			Selenium		
Filtered		PP Alk as CaCO3			Silver		
Postchlorinated					Fluorides (direct) as F		
Zeolite softened		Iron			Nitrate+Nitrite as N		
Lime-soda softened		Manganese			Nitrates as N		
Coagulated and settled					Nitrite as N		
Phosphate treatment		Calcium			Organics		
Fluoride treatment		Magnesium			Endrin		
		Sodium			Lindane		
		Potassium			Methoxychlor		
					Toxaphene		
		Chlorides as Cl			2,4-D		
FIELD EXAMINATION		Sulphates as SO4			2,4,5-TP		
pH		Phosphates as PO4					
CO2 mg/l					Radionuclides		pCi/l
Iron mg/l		Alum			Gross Alpha		
		Sp. Cond. μmhos/cm			Gross Beta		

REMARKS:

PROCEDURE FOR COLLECTING AND SUBMITTING WATER SAMPLES FOR LEAD TESTING

SUBJECT:

How to collect and submit water samples to the ISDH Chemistry Laboratories for lead testing.

PURPOSE:

To identify standard procedures that shall be used in submitting water samples for lead analysis to the ISDH Chemistry Laboratories.

1. Obtain sample bottles and Chemical Examination of Water forms from the Indiana State Department of Health, Chemistry Laboratories, (317-233-8086). *Do not use bottles that are used for the collection of bacteriological samples*.
2. Label two bottles with the resident name and address from where the samples are taken. Fill in the necessary information at the top of two separate sample submission forms, one form for each bottle.
3. On the Chemical examination of Water form, under FIELD INFORMATION, place a check mark at NO TREATMENT. Under LABORATORY EXAMINATION, place a check mark as LEAD AS PB.
4. Fill a bottle from the cold water kitchen tap after there has been no water usage for at least eight (8) hours. Collect the first water out of the tap. Label as bottle #1. (If this sample is elevated for lead, contamination may be from the plumbing in the home, service lines and/or water supply.)
5. Fill a second bottle from the cold water kitchen tap after water has run for five minutes. Label as bottle #2. (If this sample is elevated for lead, contamination may be from the water supply.)
6. Fold each form and wrap around bottle that corresponds with the sample number (1 or 2). Secure form to bottle with a rubber band.
7. Deliver samples to: Indiana State Department of Health
   Chemistry Laboratory
   P.O. Box 7202
   635 N. Barnhill Drive
   Indianapolis IN 46202-7202

Check Space	INDIANA STATE DEPARTMENT OF HEALTH	Do not write in this space
☐ Branch ☐ Dental ☐ Eng. Div. ☐ Other _____	Environmental Laboratory 635 N. Barnhill Drive--Rm 13G P.O. Box 7202 INDIANAPOLIS, INDIANA 46207-7202 **CHEMICAL EXAMINATION OF SOIL**	Lab No. _____ Date Rec. _____ Date Rep. _____

FILL IN THIS SPACE. USE SOFT PENCIL
Indiana State Department of Health is to mail report to:

(Name)

(Street) IN

(City or Town) (Zip)

Also, mail copy of report to

(Name)
ISDH - MCH – Childhood Lead Poisoning Prevention Program

(Street) IN

(City or Town) (Zip)

Name of Utility of Organization _____ Supt. _____

City or Town _____

Collected by _____ Date Collected _____ Hour _____

Where was sample collected? _____ Bottle No. _____

Name unusual conditions _____

PWS Identification Number _____

FIELD INFORMATION		LABORATORY INFORMATION					
Indicate all treatment this sample has received	***Check***		***Check***	***Do not Check mg/l***		***Check***	***Do not Check mg/l***
No treatment	X				Arsenic		
Chlorination					Barium		
Plain sedimentation		Turbidity			Cadmium		
Aerated and settled		pH			Chromium (total)		
Potassium Permanganate					Lead	X	
Coagulant Aide		Hardness as CaCO3			Mercury		
Prechlorinated		MO Alk. as CaCO3			Selenium		
Filtered		PP Alk as CaCO3			Silver		
Postchlorinated					Fluorides (direct) as F		
Zeolite softened		Iron			Nitrate+Nitrite as N		
Lime-soda softened		Manganese			Nitrates as N		
Coagulated and settled					Nitrite as N		
Phosphate treatment		Calcium			Organics		
Fluoride treatment		Magnesium			Endrin		
		Sodium			Lindane		
		Potassium			Methoxychlor		
					Toxaphene		
		Chlorides as Cl			2,4-D		
FIELD EXAMINATION		Sulphates as SO4			2,4,5-TP		
pH		Phosphates as PO4					
CO2 mg/l					Radionuclides		pCi/l
Iron mg/l		Alum			Gross Alpha		
		Sp. Cond. μmhos/cm			Gross Beta		

REMARKS:

PROCEDURE FOR COLLECTING AND SUBMITTING SOIL SAMPLES FOR LEAD TESTING

SUBJECT:

How to collect and submit soil samples to the ISDH Chemistry Laboratories for lead testing.

PURPOSE:

To identify standard procedures that shall be used in submitting soil samples for lead analysis to the ISDH Chemistry Laboratories.

1. Soil samples are collected using an uncontaminated digger. No paint chips or large pieces of debris shall be included in the soil sample.

2. Samples are usually taken within three feet (3') of the house (near the drip line) or within three feet (3') of the road. Other areas requiring sampling include exposed soil areas where children or their pets play.

3. Push the digger into the soil to a depth of approximately two inches. Place the sample into a clean sealable plastic bag.

4. Label the plastic bag with a sample identification number, date, address, name and location. Complete an ISDH Sample Submission Form for each composite soil sample collected.

5. Wipe down or wash off equipment before collecting each sample. This is necessary to avoid cross contamination.

6. Mail labeled samples and forms to:

Indiana State Department of Health
Chemistry Laboratories
P.O. Box 7207
635 North Barnhill Drive
Indianapolis, IN 46207-7202

DUST WIPE SAMPLES

INDIANA STATE DEPARTMENT OF HEALTH
INDOOR AIR LABORATORY
Lead Sample Submission Form

NAME: _____ DATE SAMPLED: _____/_____/_____
ADDRESS: _____
_____ COLLECTED BY: _____
_____
PHONE #: _____ COUNTY: _____
(Results will be sent to this address)

SAMPLE Number	SAMPLE MATERIAL	TOTAL # OF SQ. FT. SAMPLED	SAMPLE DESCRIPTION AREA OR LOCATION	DUST & WIPE *ug/ft²* LEAD

BRAND OF ALCOHOL-FREE WIPES USED: _____

The Consumer Product Safety Commission has banned residential paint and other similar surface coating materials containing more than 0.06% lead.

DUST WIPE TEST RESULT LIMITS:

<100 *ug*/ft² - floors, carpeted & uncarpeted [HUD Guidelines for Risk Assessment]
<500 *ug*/ft² - interior window sills [HUD Guidelines for Risk Assessment]
<800 *ug*/ft² - window troughs [HUD Guidelines for Risk Assessment]
<800 *ug*/ft² - exterior concrete surfaces [HUD Guidelines for Clearance Levels]

CONVERSION: *mg/ft²* X 1000 = *ug/ft²*

In case of questions, please contact:
Indiana Childhood Lead Poisoning Prevention Program: 317-233-1250 or 1-800-761-1271
Indiana State Department of Health Indoor Air Laboratory: 1-800-382-9480 ext. 8021

(Also mail copy of results to)
ADDRESS OF COUNTY HEALTH DEPT. SUBMITTING SAMPLES:
NAME: _____
ADDRESS: _____
_____
_____
FAX #: _____

COMMENTS:

PLEASE RUSH
EBL Child Investigation
Thank You.
Fax #: 317-233-1630

Revised On: 9/2000

PROCEDURE FOR COLLECTING AND SUBMITTING DUST WIPE SAMPLES FOR LEAD TESTING

SUBJECT:

How to collect and submit dust wipe samples to the ISDH Chemistry Laboratories for lead testing.

PURPOSE:

To identify standard procedures that shall be used in submitting dust wipe samples for lead analysis to the ISDH Chemistry Laboratories.

1. The supplies needed to obtain a dust wipe sample include a package of lead wipes that meet ASTM specifications or non-alcohol baby wipes, plastic disposable gloves and plastic sealable bags.

2. The local county environmental health specialist or appropriate health specialist will begin obtaining a dust wipe sample by discarding the first wipe from the container. This wipe must be discarded to avoid contamination. Put on disposable gloves prior to removing the next wipe from the container.

3. Place a clean wipe into a new sealable bag to be used as a blank standard.

4. A clean template measuring one square foot will be placed on the sampling area.

5. The wipe will be placed flat on the surface of the sampling area within the template using an open, flat hand with fingers together. The sample will be wiped with an overlapping *"S"* pattern, first side-to-side. Repeat *"S"* pattern from top to bottom so the entire area is covered.

6. Fold the wipe in half with the sample side folded in and repeat the wipe pattern.

7. Fold the wipe again with the sample side folded in and insert the folded wipe into a new sealable bag and seal.

8. Clean the template with a new wipe, discard this wipe.

9. Label the sample with name, address, date, and location where sample was collected, and number each sample. Record the same information on the sample submission form.

10. Write the brand name of the wipe used on the bottom of the Sample Submission Form.

11. For limited size and awkward shape of window sills and window wells, use a tape measure and record the length and width of the sample area. Use the same method as above to collect the sample.

12. Mail labeled samples and forms to:

Indiana State Department of Health
Chemistry Laboratories
P.O. Box 7202
635 North Barnhill Drive
Indianapolis, IN 46207-7202

PAINT CHIP SAMPLES

INDIANA STATE DEPARTMENT OF HEALTH
INDOOR AIR LABORATORY
Lead Sample Submission Form

NAME: _____ DATE SAMPLED: ____/____/____
ADDRESS: _____
_____ COLLECTED BY: _____
_____
PHONE #: _____ COUNTY: _____
(Results will be sent to this address)

SAMPLE NUMBER	SAMPLE MATERIAL	SAMPLE DESCRIPTION AREA OR LOCATION	PAINT CHIP % LEAD

The Consumer Product Safety Commission has banned residential paint and other similar surface coating materials containing more than 0.06% lead.

PAINT CHIP TEST RESULT LIMITS:
< 0.5 % (with paint chip sample of all layers) = 5000 *u*g/g = 5000 ppm [HUD Guidelines, EPA Guidance 403]

In case of questions, please contact:
Indiana Childhood Lead Poisoning Prevention Program: 317-233-1250 or 1-800-761-1271
Indiana State Department of Health Indoor Air Laboratory: 1-800-382-9480 ext. 8021

(Also mail copy of results to)
ADDRESS OF COUNTY HEALTH DEPT. SUBMITTING SAMPLES:
NAME: _____
ADDRESS: _____
_____
_____
FAX #: _____

COMMENTS:

Please RUSH
EBL Child Investigation
Thank You.
Fax #: 317-233-1630

Rev: 6/98

PROCEDURE FOR COLLECTING AND SUBMITTING PAINT CHIP SAMPLES FOR LEAD TESTING

SUBJECT:

How to collect and submit paint chip samples to the ISDH Chemistry Laboratories for lead testing.

PURPOSE:

To identify standard procedures that shall be used in submitting paint chip samples for lead analysis to the ISDH Chemistry Laboratories.

1. Occupant will sign a release provided by the local county Environmental Health Specialist prior to staff scrapping or removing paint from the surface of any dwelling.

2. The paint chips must be removed from the surface with the least amount of substrate to prevent dilution of sample. However, all layers of paint must be collected to be tested.

3. The quantity of each sample must be equal in volume to at least one teaspoon.

4. Place one sample in a zip-lock bag and label with name, address, date and location where sample was collected.

5. Each sample is numbered and listed on the Sample Submission Form supplied by the ISDH.

6. Forms and samples are to be mailed to:

Indiana State Department of Health
Chemistry Laboratories
P.O. Box 7202
635 North Barnhill Drive
Indianapolis, IN 46207-7202

Note to Risk Assessor:

Attach any lab reports. The report must include
the name, address and phone number of the lab conducting any analysis.
the analytical method used by the laboratory.

Include any background information collected during your risk assessment; specifically, you should include your interview form.

Include sample locations for all paint chips, soil, water, or wipe samples collected. You can indicate them on your site grid or document them on your sample analysis request form or chain of custody form.

Include a copy of any previous lead inspection or risk assessment reports.

Be sure you have correctly given your own accreditation and contact information in this report.

Final Risk Assessment Report and Recommendations

Site Information

Site Contact_____ Owner___ Occupant___

Site Address (incl apt. #, city, zip) _____

Date of construction _____

Summary Report

_____ This site had no observed lead hazards. No further action is required.

_____ This site had observed potential lead hazards.

[If there are children at this site, please contact your local health department for blood testing and possible detailed lead inspection. Information pamphlets on how to deal with these hazards are included.]

These hazards are present in

Peeling interior paint yes ___ no ___ not tested ___

(level found, if tested, was ____ %; standard is 0.5 %.)

Peeling exterior paint yes ___ no ___ not tested ___

(level found, if tested, was ____ %; standard is 0.5%)

Bare exterior soil

play area yes ___ no ___ not tested ___

(level found, if tested, was _____ ppm; standard is 400 ppm)

general yard yes ___ no ___ not tested ___

(level found, if tested, was _____ ppm; standard is 1200 ppm)

Drinking water yes ___ no ___ not tested ___

(level found, if tested, was _____ μg/L; standard is 15 μg/L.)

Interior floor dust yes ___ no ___ not tested ___

(level found, if tested, was _____ $\mu g/ft^2$; standard is 40 $\mu g/ft^2$)

Interior window sill dust yes ___ no ___ not tested ___

(level found, if tested, was _____ $\mu g/ft^2$; standard is 250$\mu g/ft^2$)

Lead Risk Assessment: Report and Recommendations

Note: Except as noted, you can carry out these actions at your own home without special training. For legal requirements, consult the EPA booklet or talk with your local Health Department or your Risk Assessor.

1. **Paint- or Dust-Lead Hazards:** Interior lead dust yes____ no____
   Deteriorated interior/exterior paint yes____ no____

____ Lead dust was found but no major source of lead was identified. You should clean the following areas of the dwelling weekly by wet methods, following the methods described in the enclosed pamphlet.
Locations and Priority:

____ There were small areas of deteriorated paint (peeling, friction, impact or chewed) for which wet scraping/removal can be conducted safely. Repainting the surface should follow.
Locations and Priority:

____ You have significant areas of deteriorated. Get assistance before conducting any removal of peeling lead-based paint; the chances of contaminating the house is too great otherwise.
Locations and Priority:

Whether or not paint-lead hazards were identified, never dry sand or scrape the paint, and all cleanup of future disturbed paint must be done using wet methods or HEPA vacuum.

2. **Soil-Lead Hazards:** Bare exterior soil with high lead levels yes____ no____
   Locations and Priority:

____ Do not allow children to play in these areas until remediation is complete.

____ Erect temporary fencing to keep children and animals away from the soil.

____ Plant grass to provide a tight soil cover.

____ Provide a cap for the soil; suitable cap materials might be:
_____; _____

____ Do not use bare soil areas for growing vegetable gardens or feeding animals.

____ If you choose to remove the soil, send it to a landfill for disposal.

3. Monitor paint and soil on a regular basis to determine whether it is in good condition.

____ Report to the landlord any deteriorated paint

____ Repair any deteriorated paint using methods outlined in the lead pamphlet

____ Maintain soil coverings - re-seed or re-cover as necessary

4. **Hazard:** Drinking water with high lead levels yes____ no____

____ Problem appears to be in the piping. Always let water become cold before drinking or using to make food or beverages.

____ Problem appears to be in the water supply. Switch to bottled water immediately and contact the local health department.

____ You are on a public water supply; work with the health department and your water supplier to begin remedial action.

____ You are not on a water supply; work with the health department to determine whether city water might be available.

More Extensive Hazard Reduction Options

Note: The options listed below are just that, other choices you can make regarding your lead hazaras. If you choose any items listed below, they may have to be conducted by specially trained and perhaps Indiana licensed personnel. There is nothing in this report to obligate the homeowner to undertake these recommendations

1. **Encapsulation:**

   ____ Cover a stable surface with a substrate that relies on adhesion to form a barrier between the lead-based paint and the environment.

   ____ Recommended surface(s)/Type of Encapsulant:

2. **Enclosure:**

   ____ Cover a stable surface with a rigid, durable construction material, mechanically fastened to the substrate, that forms a barrier between lead-based paint and the environment.

   ____ Recommended surface(s)/Type of Enclosure:

3. **Paint Removal:**

   ____ Use a chemical or mechanical stripper to remove paint from a substrate

   ____ Recommended component/surface(s):

4. **Component Replacement:**

   ____ Replace a component with one that does not contain lead-based paint

   ____ Recommended component(s):

5. Monitor enclosed/encapsulated surfaces every _____ months/years.

6. **XRF Summary Report Attached:** ____ Yes ____ No

   XRF Make, model and serial # _____

7. **Additional Comments (Optional)**